

Claims:

1. A method for transmitting video information, in which at least one bitstream is formed from the video information comprising a set of frames, the frames comprising macroblocks, wherein the method comprises:

 - forming at least one switching frame into said bitstream;
 - arranging macroblocks of said switching frame into a first group of macroblocks and a second group of macroblocks;
 - encoding each macroblock of said first group of macroblocks by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and
 - encoding macroblocks of said second group of macroblocks by another encoding method.
2. The method according to claim 1 comprising encoding said first group of macroblocks by an intra encoding method.
3. The method according to claim 2 comprising encoding said second group of macroblocks by a predictive encoding method.
4. The method according to claim 1 comprising arranging said macroblocks of said switching frames into a set of slices, and arranging macroblocks of one slice of said set of the slices as said first group of macroblocks, and arranging macroblocks of other slices of said set of the slices as said second group of macroblocks.
5. The method according to claim 1 comprising
 - forming at least a first switching frame and a second switching frame into said bitstream, the switching frames being divided

into mutually similar groups of macroblocks with each macroblock of the first switching frame having a spatially respective macroblock in said second switching frame;

5 arranging macroblocks of said first switching frame into a first group and a second group of macroblocks;

10 arranging macroblocks of said second switching frame into a third group and a fourth group of macroblocks so that the macroblocks of said third group of macroblocks are spatially different macroblocks than the macroblocks of said first group of macroblocks;

15 encoding each macroblock of said first group and said third group of macroblocks by a first encoding method to provide a switching point for continuing the transmission of video information with said other bitstream formed from the video information; and

20 encoding macroblocks of said second group and said fourth group of macroblocks by another encoding method.

25 6. The method according to claim 1 comprising forming an intra encoded frame from a frame of said set of frames, forming switching predictive encoded frame from a frame following said intra encoded frame, and forming said at least one switching frame from a frame following said switching predictive encoded frame.

30 7. An encoder for encoding video information into at least one bitstream, the video information comprising a set of frames comprising macroblocks, the encoder comprising:

 means for forming at least one switching frame into said bitstream;

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grouping means for arranging macroblocks of said switching frame into a first group and a second group of macroblocks;

5 first encoding means for encoding each macroblock of said first group of macroblocks by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and

10 second encoding means for encoding macroblocks of said second group of macroblocks by another encoding method.

8. The encoder according to claim 7, wherein said first encoding method is an intra encoding method.

15 9. The encoder according to claim 8, wherein said second encoding method is a predictive encoding method.

20 10. The encoder according to claim 7 comprising means for arranging said macroblocks of said switching frames into a set of slices, and for arranging macroblocks of one slice of said set of the slices as said first group of macroblocks, and for arranging macroblocks of other slices of said set of the slices as said second group of macroblocks.

25 11. The encoder according to claim 7 comprising

30 means for forming at least a first switching frame and a second switching frame into said bitstream, the switching frames being divided into mutually similar groups of macroblocks with each macroblock of the first switching frame having a spatially respective macroblock in said second switching frame;

means for arranging macroblocks of said first switching frame into a first group and a second group of macroblocks;

35 means for arranging macroblocks of said second switching frame into a third group and a fourth group of macroblocks so

that the macroblocks of said third group of macroblocks are spatially different macroblocks than macroblocks of said first group of macroblocks;

5 means for encoding each macroblock of said first group and said third group of macroblocks by a first encoding method to provide a switching point for continuing the transmission of video information with another bitstream formed from the video information; and

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means for encoding macroblocks of said second group and said fourth group of macroblocks by another encoding method.

12. The encoder according to claim 7 comprising means for forming an
15 intra encoded frame from a frame of said set of frames, for forming a switching predictive encoded frame from a frame following said intra encoded frame, and for forming said at least one switching frame from a frame following said switching predictive encoded frame.

20 13. A transmission system for transmitting video information, the system comprising an encoder for encoding video information into at least one bitstream, a transmitter for transmitting the bit stream to a receiver, and a decoder for decoding the bitstream transmitted to the receiver, the video information comprising a set of frames comprising
25 macroblocks,
the encoder comprising:

means for forming at least one switching frame into said bitstream;

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grouping means for arranging macroblocks of said switching frame into a first group and a second group of macroblocks;

35 first encoding means for encoding each macroblock of said first group of macroblocks by a first encoding method to provide a

switching point for continuing transmission of video information with another bitstream formed from the video information; and

5 second encoding means for encoding macroblocks of said second group of macroblocks by another encoding method; the decoder comprising

10 first decoding means for decoding each macroblock of said first group of macroblocks by a first decoding method corresponding to the first encoding method; and

second decoding means for decoding each macroblock of said second group of macroblocks by a second decoding method corresponding to the second encoding method.

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14. The system according to claim 13, wherein said first encoding method is an intra encoding method.

20 15. The system according to claim 14, wherein said second encoding method is a predictive encoding method.

25 16. The system according to claim 13 comprising means for arranging said macroblocks of said switching frames into a set of slices, and for arranging macroblocks of one slice of said set of the slices as said first group of macroblocks, and for arranging macroblocks of other slices of said set of the slices as said second group of macroblocks.

17. The system according to claim 13 comprising

30 means for forming at least a first and a second switching frame into said bitstream, the switching frames being divided into mutually similar groups of macroblocks with each macroblock of the first switching frame having a spatially respective macroblock in said second switching frame;

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means for arranging macroblocks of said first switching frame into a first group and a second group of macroblocks;

5 means for arranging macroblocks of said second switching frame into a third group and a fourth group of macroblocks so that the macroblocks of said third group of macroblocks are spatially different macroblocks than the macroblocks of said first group of macroblocks;

10 means for encoding each macroblock of said first group and said third group of macroblocks by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and

15 means for encoding macroblocks of said second group and said fourth group of macroblocks by another encoding method.

18. The system according to claim 13 comprising means for forming intra encoded frame from a frame of said set of frames, for forming
20 switching predictive encoded frame from a frame following said intra encoded frame, and for forming said at least one switching frame from a frame following said switching predictive encoded frame.

19. A computer program product comprising machine executable steps
25 for transmitting video information, in which at least one bitstream is formed from the video information comprising a set of frames, the frames comprising macroblocks, wherein the computer program product further comprises machine executable steps for:

30 forming at least one switching frame into said bitstream;

arranging macroblocks of said switching frame into a first group and a second group of macroblocks;

35 encoding each macroblock of said first group of macroblocks by a first encoding method to provide a switching point for

continuing transmission of video information with another bitstream formed from the video information; and

5 encoding macroblocks of said second group of macroblocks by another encoding method.

10 20. The computer program product according to claim 19 comprising machine executable steps for encoding said first group of macroblocks by an intra encoding method.

21. The computer program product according to claim 20 comprising machine executable steps for encoding said second group of macroblocks by a predictive encoding method.

15 22. The computer program product according to claim 19 comprising machine executable steps for arranging said macroblocks of said switching frames into a set of slices, and arranging macroblocks of one slice of said set of the slices as said first group of macroblocks, and
20 arranging macroblocks of other slices of said set of the slices as said second group of macroblocks.

23. The computer program product according to claim 19 comprising machine executable steps for:

25 forming at least a first switching frame and a second switching frame into said bitstream, the switching frames being divided into mutually similar groups of macroblocks, wherein each macroblock of the first switching frame having a spatially
30 respective macroblock in said second switching frame;

arranging macroblocks of said first switching frame into a first group and a second group of macroblocks;

35 arranging macroblocks of said second switching frame into a third group and a fourth group of macroblocks so that the macroblocks of said third group of macroblocks are spatially

different macroblocks than the macroblocks of said first group of macroblocks;

5 encoding each macroblock of said first group and said third group of macroblocks by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and

10 encoding macroblocks of said second group and said fourth group of macroblocks by another encoding method.

24. The computer program product according to claim 19 comprising forming an intra encoded frame from a frame of said set of frames, forming a switching predictive encoded frame from a frame following
15 said intra encoded frame, and forming said at least one switching frame from a frame following said switching predictive encoded frame.

25. A method for reducing effects of transmission errors in transmission of video information, in which at least one bitstream is
20 formed from the video information comprising a set of frames, the frames comprising macroblocks, wherein the method comprises:

25 forming at least one switching predictive encoded frame into said bitstream by predictively encoding the macroblocks of the frame;

replacing part of the switching predictive encoded macroblocks with macroblocks encoded by an intra encoding method; and

30 transmitting a frame containing both predictively encoded macroblocks and intra encoded macroblocks instead of said switching predictive encoded frame.

35 26. A computer program product comprising machine executable steps for reducing effects of transmission errors in transmission of video information, in which at least one bitstream is formed from the video

information comprising a set of frames, the frames comprising macroblocks, wherein the computer program product further comprises machine executable steps for:

5 forming at least one switching predictive encoded frame into said bitstream by predictively encoding the macroblocks of the frame;

10 replacing part of the switching predictive encoded macroblocks with macroblocks encoded by an intra encoding method; and

15 transmitting the encoded frame containing both predictively encoded macroblocks and intra encoded macroblocks instead of said switching predictive encoded frame.

27. A signal for transmitting video information, in which at least one bitstream is formed from the video information comprising a set of frames, the frames comprising macroblocks, wherein the signal comprises:

20 at least one switching frame;

25 macroblocks of said switching frame being arranged into a first group and a second group of macroblocks;

 each macroblock of said first group of macroblocks being encoded by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and

30 macroblocks of said second group of macroblocks being encoded by another encoding method.

28. The signal according to claim 27, wherein said first group of macroblocks are encoded by an intra encoding method.

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29. The signal according to claim 28, wherein said second group of macroblocks are encoded by a predictive encoding method.

5 30. The signal according to claim 27, wherein said macroblocks of said switching frames are arranged into a set of slices, and macroblocks of one slice of said set of the slices are arranged as said first group of macroblocks, and macroblocks of other slices of said set of the slices are arranged as said second group of macroblocks.

10 31. The signal according to claim 27 comprising

at least a first switching frame and a second switching frame formed into said bitstream, the switching frames being divided into mutually similar groups of macroblocks, wherein each
15 macroblock of the first switching frame having a spatially respective macroblock in said second switching frame;

macroblocks of said first switching frame are arranged into a first group and a second group of macroblocks;
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macroblocks of said second switching frame are arranged into a third group and a fourth group of macroblocks so that the macroblocks of said third group of macroblocks are spatially different macroblocks than the macroblocks of said first group of
25 macroblocks;

each macroblock of said first group and said third group of macroblocks are encoded by a first encoding method to provide a switching point for continuing transmission of video information with another bitstream formed from the video information; and
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macroblocks of said second group and said fourth group of macroblocks are encoded by another encoding method.

35 32. The signal according to claim 27, wherein an intra encoded frame is formed from a frame of said set of frames, an switching predictive

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encoded frame is formed from a frame following said intra encoded frame, and said at least one switching frame is formed from a frame following said switching predictive encoded frame.